39 Pages

DEPARTMENT OF CONSUMER & INDUSTRY SERVICES

DIRECTOR'S OFFICE

OCCUPATIONAL HEALTH STANDARDS

Filed with the Secretary of State on December 7, 1990 (**as amended April 23, 2001**)

These rules take effect 15 days after filing with the Secretary of State

(By authority conferred on the director of the department of consumer and industry services by sections 14 and 24 of 1974 PA 154, MCL 408.1014 and 408.1024 and Executive Reorganization Order Nos. 1996-1 and 1996-2, MCL 330.3101 and 445.2001)

R 325.51102, R 325.51103, R 325.51104, R 325.51105, and R 325.51108 are amended and R 325.51106 is rescinded of the Michigan Administrative Code as follows:

Bureau of Safety and Regulation, Standards Division Web-Site: www.cis.state.mi.us/bsr/divisions/std

PART 301. AIR CONTAMINANTS

TABLE OF CONTENTS

R 325.51101 Applicability; replacement of O.H. rules.

Rule 1. (1) These rules do not apply to the following types of employment:

(a) Agriculture.
(b) Construction.
(c) Domestic.
(d) Mining.

(2) These rules replace O.H. rules 2101, 2102, 2103, and 2104.

R 325.51102 Definitions.

Rule 2. As used in these rules:

(a) **"Ceiling"** means the employee's exposure which shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute, time-weighted average exposure which shall not be exceeded during any part of the working day.

(b) **"Skin designation"** means those substances so indicated that have toxic effects due to absorption through an employee's skin.

(c) **"Short-term exposure limit (STEL)"** means the employee's 15-minute, time-weighted average exposure which shall not be exceeded at any time during a workday, unless another time limit is specified in a parenthetical notation below the limit. If another time period is specified, then the time-weighted average exposure over that time limit shall not be exceeded at any time during the workday.

(d) **"Time-weighted average (TWA)"** means the employee's average airborne exposure in any 8-hour workshift of a 40-hour workweek that shall not be exceeded.

(e) The terms **"substance"** and **"air contaminant"** are equivalent in meaning for purposes of these rules.

R 325.51103 Exposure limits.

Rule 3. An employer shall ensure that an employee exposure to any substance listed in tables G-1-A or G-2 in R 325.51108 is limited in accordance with the requirements of all of the following provisions:

(a) With respect to table G-1-A, all of the following provisions apply:
  (i) Removed (May 9, 2001).
  (ii) Removed (May 9, 2001).
  (iii) An employee's exposure to any substance listed in table G-1-A shall not exceed the time-weighted average (TWA) limit, short-term exposure limit (STEL) and ceiling limit specified for that substance in table G-1-A.
  (iv) To prevent or reduce skin absorption, an employee's skin exposure to substances listed in table G-1-A with an "X" in the skin designation column following the substance name shall be prevented or reduced to the extent necessary through the use of gloves, coveralls, goggles, or other appropriate personal protective equipment, engineering controls, or work practices.
  (v) An employee shall not be exposed to air concentrations between the TWA and STEL limits more than 4 times in a workshift and such exposures shall be no less than 60 minutes apart.

(b) With respect to table G-2, all of the following provisions apply:
  (i) An employee's exposure to any substance listed in table G-2 in any 8-hour workshift of a 40-hour workweek shall not exceed the 8-hour, time-weighted average limit given for that substance in table G-2.
  (ii) An employee's exposure to a substance listed in table G-2 shall not exceed, at any time during an

8-hour workshift, the acceptable ceiling concentration limit given for the substance in the table, except for a period of time and up to a concentration that does not exceed the maximum duration and concentration allowed in the column under "Acceptable maximum peak above the ceiling concentration for an 8-hour workshift." For example, during an 8-hour workshift, an employee may be exposed to a concentration of substance A (with a 10 parts of the substance per million parts of air (ppm) TWA, 25 ppm ceiling and 50 ppm peak) above 25 ppm (but not above 50 ppm) only for a maximum period of 10 minutes. Such an exposure shall be compensated for by exposures to concentrations less than 10 ppm so the cumulative exposure for the entire 8-hour workshift does not exceed a time-weighted average of 10 ppm.

(iii) If a substance is preceded by an "S", then an employer shall take the necessary precautions to prevent an employee from absorbing the substance through his or her skin.

R 325.51104 Computation formulae.

Rule 4. The computation formulas that shall apply to employee exposure to one or more substances that have an 8-hour, time-weighted average listed in table G-1-A or G-2 to determine whether an employee is exposed in excess of the exposure limit are as follows:

(a) An employer shall compute the cumulative exposure for multiple exposures to a single substance for an 8-hour workshift as follows:

$$E = (C_1T_1 + C_2T_2 + \ldots C_nT_n) \div 8 \text{ hours}$$

Where: E is the cumulative exposure for an 8-hour workshift.

C_1 is the substance concentration during the first period of time "T" where the concentration remains constant.

C_2 is the substance concentration during the second period of time "T" where the concentration remains constant.

T is the period of time in hours for which the substance concentration C remains constant.

The value of E shall not exceed the 8-hour, time-weighted average limit for the substance as specified in table G-1-A or G-2.

To illustrate the formula for a cumulative exposure to a single substance, assume that substance A has an 8-hour, time-weighted average exposure limit of 100 ppm noted in table G-1-A. Assume that an employee is subject to the following exposures over an 8-hour workshift:

Two hours' exposure at 150 ppm
Two hours' exposure at 75 ppm
Four hours' exposure at 50 ppm

Substituting this information into the formula:

E = [(150 ppm X 2 hrs) + (75 ppm X 2 hrs) + (50 ppm X 4 hrs)] / 8 hrs

E = [300 ppm • hrs + 150 ppm • hrs + 200 ppm • hrs] / 8 hrs

E = 650 ppm • hrs / 8 hrs = 81.25 ppm

Since the cumulative exposure of 81.25 ppm is less than the exposure limit of 100 ppm, then the employee's 8-hour workshift exposure is acceptable.

(b) An employer shall compute the equivalent exposure for a mixture of air contaminants for an 8-hour workshift as follows:

$$E_m = (C_1 \div L_1 + C_2 \div L_2) + \ldots (C_n \div L_n)$$

Where: E_m is the equivalent exposure to the mixture of air contaminants during an 8-hour workshift.

C_1 is the average 8-hour concentration of the first substance.

C_2 is the average 8-hour concentration of the second substance.

L is the 8-hour, TWA exposure limit for that particular substance.

The value of E_m shall not exceed a value of one (1.0).

To illustrate the formula for a mixture of air contaminants, assume the following exposures:

Substances in Mixture	Average concentration of 8-hour exposure (C)	8-hour TWA exposure limit (L)
Substance A	500 ppm	1,000 ppm
Substance B	45 ppm	200 ppm
Substance D	40 ppm	200 ppm

Substituting this information into the formula:

E_m = (500 ppm / 1,000 ppm) + (45 ppm / 200 ppm) + (40 ppm / 200 ppm)

E_m = 0.500 + 0.225 + 0.200

E_m = 0.925

Since the value of E_m did not exceed one (1.0), the employee's 8-hour workshift exposure to the mixture of air contaminants is acceptable.

R 325.51105 Methods of compliance.

Rule 5. To achieve compliance with the provisions of R 325.51103 and R 325.51104, administrative or engineering controls shall first be determined and implemented when feasible. If such controls are not feasible to achieve full compliance, then personal protective equipment or any other protective measures shall be used to keep the employee's exposure to air contaminants within the exposure limits prescribed in these rules. Any equipment and technical measures used for this purpose shall be approved for each particular use by a competent industrial hygienist or other technically qualified person. When a respirator is used, its use shall comply with the provisions of R 325.60051 et seq. Respiratory Protection, Part 451.

R 325.51106 Rescind (May 9, 2001).

R 325.51107 Stay of enforcement.

Rule 7. Enforcement of the limits are indefinitely stayed for the following substances until the United States department of labor, occupational safety and health administration (OSHA) publishes in the Federal Register a notice that a sampling and analytical technique is available:

(a) Aluminum alkyls.
(b) Ethylidine norbornene.
(c) Hexafluoroacetone.
(d) Mercury (alkyl compounds).
(e) Oxygen difluoride.
(f) Phenylphosphine.
(g) Sulfur pentafluoride.

R 325.51108 Tables.

Rule 8. Tables G-1-A and G-2 read as follows:

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	Skin Designation
Abate		–	15	–	–	–	–	–
Acetaldehyde	75-07-0	100	180	150	270	–	–	–
Acetic acid	64-19-7	10	25	–	–	–	–	–
Acetic anhydride	108-24-7	–	–	–	–	5	20	–
Acetone	67-64-1	750	1800	1000	2400	–	–	–
Acetonitrile	75-05-8	40	70	60	105	–	–	–
2-Acetylaminofluorine; see O.H. rule 2301(1)[F]	53-96-3							
Acetylene dichloride; see 1,2-Dichloroethylene								
Acetylene tetrabromide	79-27-6	1	14	–	–	–	–	–
Acetylsalicylic acid (Aspirin)	50-78-2	–	5	–	–	–	–	–
Acrolein	107-02-8	0.1	0.25	0.3	0.8	–	–	–
Acrylamide	79-06-1	–	0.03	–	–	–	–	x
Acrylic acid	79-10-7	10	30	–	–	–	–	x
Acrylonitrile; see R 325.51501 et seq.[F]	107-13-1	2	4.34	10	21.7			
Aldrin	309-00-2	–	0.25	–	–	–	–	x
Allyl alcohol	107-18-6	2	5	4	10	–	–	x
Allyl chloride	107-05-1	1	3	2	6	–	–	–
Allyl glycidyl ether (AGE)	106-92-3	5	22	10	44	–	–	–
Allyl propyl disulfide	2179-59-1	2	12	3	18	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
α Alumina (aluminum oxide)	1344-28-1							
Respirable fraction		–	5	–	–	–	–	–
Total dust		–	10	–	–	–	–	–
Aluminum (as Al)	7429-90-5							
Alkyls		–	2	–	–	–	–	–
Metal		–		–	–	–	–	–
Respirable dust		–	5	–	–	–	–	–
Total dust		–	15	–	–	–	–	–
Pyro powders		–	5	–	–	–	–	–
Soluble salts		–	2	–	–	–	–	–
Welding fumes*		–	5	–	–	–	–	–
4-Aminodiphenyl; see O.H. rule 2301(2)[F]	92-67-1							
2-Aminoethanol; see Ethanolamine								
2-Aminopyridine	504-29-0	0.5	2	–	–	–	–	–
Amitrole	61-82-5	–	0.2	–	–	–	–	–
Ammonia	7664-41-7	–	–	35	27	–	–	–
Ammonium chloride fume	12125-02-9	–	10	–	20	–	–	–
Ammonium sulfamate	7773-06-0							
Respirable dust		–	5	–	–	–	–	–
Total dust		–	10	–	–	–	–	–
n-Amyl acetate	628-63-7	100	525	–	–	–	–	–
sec-Amyl acetate	626-38-0	125	650	–	–	–	–	–
Aniline and homologues	62-53-3	2	8	–	–	–	–	x
Anisidine (o- and p-isomers)	29191-52-4	–	0.5	–	–	–	–	x
Antimony and compounds (as Sb)	7440-36-0	–	0.5	–	–	–	–	–
ANTU (alpha-naphthylthiourea)	86-88-4	–	0.3	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	Skin Designation
Arsenic, organic compounds (as As)	7440-38-2	–	0.5	–	–	–	–	–
Arsenic, inorganic compounds (as As); see R 325.51601 et seq.[F]	7440-38-2		0.01					
Arsine	7784-42-1	0.05	0.2	–	–	–	–	–
		TWA		STEL				
Asbestos; see R 325.51311 et seq.[F]	Varies	0.1f/cc		–				
		ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]			
Atrazine	1912-24-9	–	5	–	–	–	–	–
Azinphos-methyl	86-50-0	–	0.2	–	–	–	–	x
Barium, soluble compounds (as Ba)	7440-39-3	–	0.5	–	–	–	–	–
Barium sulfate Respirable dust Total dust	7727-43-7	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Benomyl Respirable dust Total dust	17804-35-2	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Benzene[E]; see R 325.77101 et seq.[F] and table G-2 for limits applicable in the operations or sectors excluded in R 325.77101[E]	71-43-2	1	3.19	5	15.97			
Benzidine; see O.H. rule 2301(3)	92-87-5							
p-Benzoquinone; see Quinone								
Benzo(a)pyrene; see Coal tar pitch volatiles								
Benzoyl peroxide	94-36-0	–	5	–	–	–	–	–
Benzyl chloride	100-44-7	1	5	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Beryllium and beryllium compounds (as Be)	7440-41-7	See table G-2						
Biphenyl; see Diphenyl								
Bismuth telluride, Undoped	1304-82-1							
Respirable dust		–	5	–	–	–	–	–
Total dust		–	15	–	–	–	–	–
Bismuth telluride, Se-doped		–	5	–	–	–	–	–
Borates, Tetra, Sodium Salts								
Anhydrous	1330-43-4	–	10	–	–	–	–	–
Decahydrate	1303-96-4	–	10	–	–	–	–	–
Pentahydrate	12179-04-3	–	10	–	–	–	–	–
Boron oxide, Total dust	1303-86-2	–	10	–	–	–	–	–
Boron tribromide	10294-33-4	–	–	–	–	1	10	–
Boron trifluoride	7637-07-2	–	–	–	–	1	3	–
Bromacil	314-40-9	1	10	–	–	–	–	–
Bromine	7726-95-6	0.1	0.7	0.3	2	–	–	–
Bromine pentafluoride	7789-30-2	0.1	0.7	–	–	–	–	–
Bromoform	75-25-2	0.5	5	–	–	–	–	–
1,3-Butadiene; see R 325.50091 et seq.[F]	106-99-0	1	2.2	5	11.1	–	–	–
Butane	106-97-8	800	1900	–	–	–	–	–
Butanethiol; see Butyl mercaptan								
2-Butanone (Methyl ethyl ketone)	78-93-3	200	590	300	885	–	–	–
2-Butoxyethanol	111-76-2	25	120	–	–	–	–	x
n-Butyl acetate	123-86-4	150	710	200	950	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
sec-Butyl acetate	105-46-4	200	950	–	–	–	–	–
tert-Butyl acetate	540-88-5	200	950	–	–	–	–	–
Butyl acrylate	141-32-2	10	55	–	–	–	–	–
n–Butyl alcohol (n-butanol)	71-36-3	–	–	–	–	50	150	x
sec-Butyl alcohol (sec-butanol)	78-92-2	100	305	–	–	–	–	–
tert-Butyl alcohol (tert-butanol)	75-65-0	100	300	150	450	–	–	–
Butylamine	109-73-9	–	–	–	–	5	15	x
tert-Butyl chromate (as CrO_3)	1189-85-1	–	–	–	–	–	0.1	x
n-Butyl glycidyl ether (BGE)	2426-08-6	25	135	–	–	–	–	–
n-Butyl lactate	138-22-7	5	25	–	–	–	–	–
Butyl mercaptan	109-79-5	0.5	1.5	–	–	–	–	–
o-sec-Butylphenol	89-72-5	5	30	–	–	–	–	x
p-tert-Butyltoluene	98-51-1	10	60	20	120	–	–	–
Cadmium; see R 325.51851 et seq.[F]	7440-43-9	–	0.005	–	–	–	–	–
Calcium carbonate, Respirable dust Total dust	1317-65-3	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Calcium cyanamide	156-62-7	–	0.5	–	–	–	–	–
Calcium hydroxide	1305-62-0	–	5	–	–	–	–	–
Calcium oxide	1305-78-8	–	5	–	–	–	–	–
Calcium silicate, Respirable dust Total dust	1344-95-2	 – –	 5 15	 – –	 – –	 – –	 – –	 – –

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Calcium sulfate, Respirable dust Total dust	7778-18-9	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Camphor, synthetic	76-22-2	–	2	–	–	–	–	–
Caprolactam, Dust Vapor	105-60-2	 – 5	 1 20	 – 10	 3 40	 – –	 – –	 – –
Captafol (Difolatan®)	2425-06-1	–	0.1	–	–	–	–	–
Captan	133-06-2	–	5	–	–	–	–	–
Carbaryl (Sevin®)	63-25-2	–	5	–	–	–	–	–
Carbofuran (Furadan®)	1563-66-2	–	0.1	–	–	–	–	–
Carbon black	1333-86-4	–	3.5	–	–	–	–	–
Carbon dioxide	124-38-9	10,000	18,000	30,000	54,000	–	–	–
Carbon disulfide	75-15-0	4	12	12	36	–	–	x
Carbon monoxide	630-08-0	35	40	–	–	200	229	–
Carbon tetrabromide	558-13-4	0.1	1.4	0.3	4	–	–	–
Carbon tetrachloride (Tetrachloromethane)	56-23-5	2	12.6	–	–	–	–	x
Carbonyl fluoride	353-50-4	2	5	5	15	–	–	–
Catechol (Pyrocatechol)	120-80-9	5	20	–	–	–	–	x
Cellulose, Respirable dust Total dust	9004-34-6	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Cesium hydroxide	21351-79-1	–	2	–	–	–	–	–
Chlordane	57-74-9	–	0.5	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Chlorinated camphene (Toxaphone)	8001-35-2	–	0.5	–	1	–	–	x
Chlorinated diphenyl oxide	55720-99-5 *or* 31242-93-0	–	0.5	–	–	–	–	–
Chlorine	7782-50-5	0.5	1.5	1	3	–	–	–
Chlorine dioxide	10049-04-4	0.1	0.3	0.3	0.9	–	–	–
Chlorine trifluoride	7790-91-2	–	–	–	–	0.1	0.4	–
Chloroacetaldehyde	107-20-0	–	–	–	–	1	3	–
2-Chloroacetophenone (Phenacyl chloride)	532-27-4	0.5	0.3	–	–	–	–	–
Chloroacetyl chloride	79-04-9	0.5	0.2	–	–	–	–	–
Chlorobenzene	108-90-7	75	350	–	–	–	–	–
o-Chlorobenzylidene malononitrile	2698-41-1	–	–	–	–	0.05	0.4	x
Chlorobromomethane	74-97-5	200	1050	–	–	–	–	–
2-Chloro-1,3-butadiene; see β-Chloroprene								
Chlorodifluoromethane	75-45-6	1000	3500	–	–	–	–	–
Chlorodiphenyl (42% Chlorine) (PCB)	53469-21-9	–	1	–	–	–	–	x
Chlorodiphenyl (54% Chlorine) (PCB)	11097-69-1	–	0.5	–	–	–	–	x
1-Chloro-2,3-epoxy propane; see Epichlorohydrin								
2-Chloroethanol; see Ethylene chlorohydrin								
Chloroethylene; see Vinyl chloride								
Chloroform (Trichloromethane)	67-66-3	2	9.78	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
bis (Chloromethyl) ether; see O.H. Rule 2301(4)[F]	542-88-1							
Chloromethyl methyl ether; see O.H. rule 2301(8)	107-30-2							
1-Chloro-1-nitropropane	600-25-9	4	10	–	–	–	–	–
Chloropentafluoroethane	76-15-3	1000	6320	–	–	–	–	–
Chloropicrin	76-06-2	0.1	0.7	–	–	–	–	–
beta-Chloroprene	126-99-8	10	35	–	–	–	–	x
o-Chlorostyrene	2039-87-4	50	285	75	428	–	–	–
o-Chlorotoluene	95-49-8	50	250	–	–	–	–	–
2-Chloro-6-(trichloromethyl) pyridine, Respirable dust Total dust	1929-82-4	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Chlorpyrifos	2921-88-2	–	0.2	–	–	–	–	x
Chromic acid and chromates (as CrO_3)	Varies with compound	–	–	–	–	–	0.1	–
Chromium (II) compounds (as Cr)	7440-47-3	–	0.5	–	–	–	–	–
Chromium (III) compounds (as Cr)	7440-47-3	–	0.5	–	–	–	–	–
Chromium metal (as Cr)	7440-47-3	–	1	–	–	–	–	–
Chrysene; see Coal tar pitch volatile								
Clopidol Respirable dust Total dust	2971-90-6	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Coal dust (less than 5% SiO_2) Respirable quartz dust	–	–	2	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Coal dust (greater than or equal to 5% SiO_2), Respirable dust	–	–	0.1	–	–	–	–	–
Coal tar pitch volatile (as benzene solubles) anthracene, BaP, phenanthrene, acridine, crysene, pyrene	65996-93-2	–	0.2	–	–	–	–	–
Cobalt metal, dust, and fume (as Co)	7440-48-4	–	0.05	–	–	–	–	–
Cobalt carbonyl (as Co)	10210-68-1	–	0.1	–	–	–	–	–
Cobalt hydrocarbonyl (as Co)	16842-03-8	–	0.1	–	–	–	–	–
Coke oven emissions; see R 325.50101 et seq.[F]	–		0.15 (150 ug/m³)					
Copper, Dusts and mists (as Cu) Fume (as Cu)	7440-50-8	– –	1 0.1	– –	– –	– –	– –	– –
Cotton dust (raw)	–		1	–	–	–	–	–
Crag herbicide (Sesone) Total dust Respirable fraction	136-78-7	– –	10 5	– –	– –	– –	– –	– –
Cresol, all isomers	1319-77-3	5	22	–	–	–	–	x
Crotonaldehyde	123-73-9 4170-30-3	2	6	–	–	–	–	–
Crufomate	299-86-5	–	5	–	–	–	–	–
Cumene	98-82-8	50	245	–	–	–	–	x
Cyanamide	420-04-2	–	2	–	–	–	–	–
Cyanides (as CN)	Varies with compound	–	5	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Cyanogen	460-19-5	10	20	–	–	–	–	–
Cyanogen chloride	506-77-4	–	–	–	–	0.3	0.6	–
Cyclohexane	110-82-7	300	1050	–	–	–	–	–
Cyclohexanol	108-93-0	50	200	–	–	–	–	x
Cyclohexanone	108-94-1	25	100	–	–	–	–	x
Cyclohexene	110-83-8	300	1015	–	–	–	–	–
Cyclohexylamine	108-91-8	10	40	–	–	–	–	–
Cyclonite	121-82-4	–	1.5	–	–	–	–	x
Cyclopentadiene	542-92-7	75	200	–	–	–	–	–
Cyclopentane	287-92-3	600	1720	–	–	–	–	–
Cyhexatin	13121-70-5	–	5	–	–	–	–	–
2,4-D (Dichlorophenoxyacetic acid)	94-75-7	–	10	–	–	–	–	–
Decaborane	17702-41-9	0.05	0.3	0.15	0.9	–	–	x
Demeton (Systox®)	8065-48-3	–	0.1	–	–	–	–	x
Diacetone alcohol (4-Hydroxy-4-methyl-2-pentanone)	123-42-2	50	240	–	–	–	–	–
1,2-Diaminoethane; see Ethylenediamine								
Diazinon	333-41-5	–	0.1	–	–	–	–	x
Diazomethane	334-88-3	0.2	0.4	–	–	–	–	–
Diborane	19287-45-7	0.1	0.1	–	–	–	–	–
2-N-Dibutylaminoethanol	102-81-8	2	14	–	–	–	–	–
Dibutyl phosphate	107-66-4	1	5	2	10	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m[3C]	ppm[B]	mg/m[3C]	ppm[B]	mg/m[3C]	Skin Designation
Dibutyl phthalate	84-74-2	–	5	–	–	–	–	–
Dichloroacetylene	7572-29-4	–	–	–	–	0.1	0.4	–
o-Dichlorobenzene	95-50-1	–	–	–	–	50	300	–
p-Dichlorobenzene	106-46-7	75	450	110	675	–	–	–
3,3'-Dichlorobenzidine; see O.H. rule 2301(5)[F]	91-94-1							
Dichlorodifluoromethane	75-71-8	1000	4950	–	–	–	–	–
1,3-Dichloro-5,5-dimethyl hydantoin	118-52-5	–	0.2	–	0.4	–	–	–
Dichlorodiphenyltri-chloroethane (DDT)	50-29-3	–	1	–	–	–	–	x
1,1-Dichloroethane	75-34-3	100	400	–	–	–	–	–
1,2-Dichloroethylene	540-59-0	200	790	–	–	–	–	–
Dichloroethyl ether	111-44-4	5	30	10	60	–	–	x
Dichlorofluoromethane	75-43-4	10	40	–	–	–	–	–
Dichloromethane; see Methylene chloride								
1,1-Dichloro-1-nitroethane	594-72-9	2	10	–	–	–	–	–
1,2-Dichloropropane; see Propylene dichloride								
1,3-Dichloropropene	542-75-6	1	5	–	–	–	–	x
2,2-Dichloropropionic acid	75-99-0	1	6	–	–	–	–	–
Dichlorotetrafluoroethane	76-14-2	1000	7000	–	–	–	–	–
Dichlorvos (DDVP)	62-73-7	–	1	–	–	–	–	x
Dicrotophos	141-66-2	–	0.25	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Dicyclopentadiene	77-73-6	5	30	–	–	–	–	–
Dicyclopentadienyl iron, Respirable dust Total dust	102-54-5	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Dieldrin	60-57-1	–	0.25	–	–	–	–	x
Diethanolamine	111-42-2	3	15	–	–	–	–	–
Diethylamine	109-89-7	10	30	25	75	–	–	–
2-Diethylaminoethanol	100-37-8	10	50	–	–	–	–	x
Diethylene triamine	111-40-0	1	4	–	–	–	–	x
Diethyl ether; see Ethyl ether								
Diethyl ketone	96-22-0	200	705	–	–	–	–	–
Diethyl phthalate	84-66-2	–	5	–	–	–	–	–
Difluorodibromomethane	75-61-6	100	860	–	–	–	–	–
Diglycidyl ether (DGE)	2238-07-5	0.1	0.5	–	–	–	–	–
Dihydroxybenzene; see Hydroquinone								
Diisobutyl ketone	108-83-8	25	150	–	–	–	–	–
Diisopropylamine	108-18-9	5	20	–	–	–	–	x
4-Dimethylaminoazobenzene; see O.H. rule 2301(6)[F]	60-11-7							
Dimethoxymethane; see Methylal								
Dimethyl acetamide	127-19-5	10	35	–	–	–	–	x
Dimethylamine	124-40-3	10	18	–	–	–	–	–
Dimethylaminobenzene; see Xylidine								

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Dimethylaniline (N,N-Dimethylaniline)	121-69-7	5	25	10	50	–	–	x
Dimethylbenzene; see Xylene								
Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate	300-76-5	–	3	–	–	–	–	x
Dimethylformamide	68-12-2	10	30	–	–	–	–	x
2,6-Dimethyl-4-heptanone; see Diisobutyl ketone								
1,1-Dimethylhydrazine	57-14-7	0.5	1	–	–	–	–	x
Dimethylphthalate	131-11-3	–	5	–	–	–	–	–
Dimethyl sulfate	77-78-1	0.1	0.5	–	–	–	–	x
Dinitolmide (3,5-Dinitro-o-toluamide)	148-01-6	–	5	–	–	–	–	–
Dinitrobenzene (all isomers) (meta-) (ortho) (para-)	 99-65-0 528-29-0 100-25-4	–	1	–	–	–	–	x
Dinitro-o-cresol	534-52-1	–	0.2	–	–	–	–	x
Dinitrotoluene	25321-14-6	–	1.5	–	–	–	–	x
Dioxane (Diethylene dioxide)	123-91-1	25	90	–	–	–	–	x
Dioxathion (Delnav)	78-34-2	–	0.2	–	–	–	–	x
Diphenyl (Biphenyl)	92-52-4	0.2	1	–	–	–	–	–
Diphenylamine	122-39-4	–	10	–	–	–	–	–
Diphenylmethane diisocyanate; see Methylene bisphenyl isocyanate								
Dipropylene glycol methyl ether	34590-94-8	100	600	150	900	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Dipropyl ketone	123-19-3	50	235	–	–	–	–	–
Diquat	2768-72-9	–	0.5	–	–	–	–	–
Di-sec-octyl phthalate [Di(2-ethylhexyl)phthalate]	117-81-7	–	5	–	10	–	–	–
Disulfiram	97-77-8	–	2	–	–	–	–	–
Disulfoton	298-04-4	–	0.1	–	–	–	–	x
2,6-Di-tert-butyl-p-cresol (Butylated hydroxytoluene)	128-37-0	–	10	–	–	–	–	–
Diuron	330-54-1	–	10	–	–	–	–	–
Divinyl benzene	1321-74-0	10	50	–	–	–	–	–
Emery, Respirable dust Total dust	1302-74-5	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Endosulfan	115-29-7	–	0.1	–	–	–	–	x
Endrin	72-20-8	–	0.1	–	–	–	–	x
Epichlorohydrin	106-89-8	2	8	–	–	–	–	x
EPN	2104-64-5	–	0.5	–	–	–	–	x
1,2-Epoxypropane; see Propylene oxide								
2,3-Epoxy-1-propanol; see Glycidol								
Ethanethiol; see Ethyl mercaptan								
Ethanolamine	141-43-5	3	8	6	15	–	–	–
Ethion	563-12-2	–	0.4	–	–	–	–	x
2-Ethoxyethanol (EGEE)	110-80-5	200	740	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	100	540	–	–	–	–	x
Ethyl acetate	141-78-6	400	1400	–	–	–	–	–
Ethyl acrylate	140-88-5	5	20	25	100	–	–	x
Ethyl alcohol (Ethanol)	64-17-5	1000	1900	–	–	–	–	–
Ethylamine	75-04-7	10	18	–	–	–	–	–
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25	130	–	–	–	–	–
Ethyl benzene	100-41-4	100	435	125	545	–	–	–
Ethyl bromide	74-96-4	200	890	250	1100	–	–	–
Ethyl butyl ketone (3-Heptanone)	106-35-4	50	230	–	–	–	–	–
Ethyl chloride	75-00-3	1000	2600	–	–	–	–	–
Ethyl ether	60-29-7	400	1200	–	500	1500	–	–
Ethyl formate	109-94-4	100	300	–	–	–	–	–
Ethyl mercaptan	75-08-1	0.5	1	–	–	–	–	–
Ethyl silicate	78-10-4	10	85	–	–	–	–	–
Ethylene chlorohydrin	107-07-3	–	–	–	–	1	3	x
Ethylenediamine	107-15-3	10	25	–	–	–	–	–
Ethylene dibromide	106-93-4	See table G-2						
Ethylene dichloride	107-06-2	1	4	2	8	–	–	–
Ethylene glycol	107-21-1	–	–	–	–	50	125	–
Ethylene glycol dinitrate (EGDN)	628-96-6	–	–	–	0.1	–	–	x
Ethylene glycol methyl acetate (EGME); see Methyl cellosolve acetate								

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Ethyleneimine; see O.H. rule 2301(7)	151-56-4							
Ethylene oxide; see R 325.51151 et seq.[F]	75-21-8	1	1.8	5	9.0	-	-	-
Ethylidene chloride; see 1,1-Dichloroethane								
Ethylidene norbornene	16219-75-3	–	–	–	–	5	25	–
N-Ethylmorpholine	100-74-3	5	23	–	–	–	–	x
Fenamiphos	22224-92-6	–	0.1	–	–	–	–	x
Fensulfothion (Dasanit)	115-90-2	–	0.1	–	–	–	–	–
Fenthion	55-38-9	–	0.2	–	–	–	–	x
Ferbam, Dust	14484-64-1	–	10	–	–	–	–	–
Ferrovanadium dust	12604-58-9	–	1	–	3	–	–	–
Fluorides (as F)	Varies with compound	–	2.5	–	–	–	–	–
Fluorine	7782-41-4	0.1	0.2	–	–	–	–	–
Fluorotrichloromethane (Trichlorofluoromethane)	75-69-4	–	–	–	–	1000	5600	–
Fonofos	944-22-9	–	0.1	–	–	–	–	x
Formaldehyde; see R 325.51451 et seq.[F]	50-00-0	0.75	0.9	2	2.5			
Formamide	75-12-7	20	30	30	45	–	–	–
Formic acid	64-18-6	5	9	–	–	–	–	–
Furfural	98-01-1	2	8	–	–	–	–	x
Furfuryl alcohol	98-00-0	10	40	15	60	–	–	x
Gasoline	8006-61-9	300	900	500	1500	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Germanium tetrahydride	7782-65-2	0.2	0.6	–	–	–	–	–
Glutaraldehyde	111-30-8	–	–	–	–	0.2	0.8	–
Glycerin, Respirable mist Total mist	56-81-5	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Glycidol	556-52-5	25	75	–	–	–	–	–
Glycol monoethyl ether; see 2-Ethoxyethanol								
Grain dust (Oat, wheat, barley)	–	–	10	–	–	–	–	–
Graphite, natural Respirable dust	7782-42-5	–	2.5	–	–	–	–	–
Graphite, synthetic, Respirable dust Total dust	–	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Guthion[R]; see Azinphos methyl								
Gypsum, Respirable dust Total dust	13397-24-5	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Hafnium	7440-58-6	–	0.5	–	–	–	–	–
Heptachlor	76-44-8	–	0.5	–	–	–	–	x
Heptane (n-Heptane)	142-82-5	400	1600	500	2000	–	–	–
Hexachlorobutadiene	87-68-3	–	0.02	0.24	–	–	–	–
Hexachlorocyclopentadiene	77-47-4	0.01	0.1	–	–	–	–	–
Hexachloroethane	67-72-1	1	10	–	–	–	–	x
Hexachloronaphthalene	1335-87-1	–	0.2	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Hexafluoroacetone	684-16-2	0.1	0.7	–	–	–	–	x
n-Hexane	110-54-3	50	180	–	–	–	–	–
Hexane isomers	Varies with compound	500	1800	1000	3600	–	–	–
2-Hexanone (Methyl n-butyl ketone)	591-78-6	5	20	–	–	–	–	–
Hexone (Methyl isobutyl ketone)	108-10-1	50	205	75	300	–	–	–
sec-Hexyl acetate	108-84-9	50	300	–	–	–	–	–
Hexylene glycol	107-41-5	–	–	–	–	25	125	–
Hydrazine	302-01-2	0.1	0.1	–	–	–	–	x
Hydrogenated terphenyls	61788-32-7	0.5	5	–	–	–	–	–
Hydrogen bromide	10035-10-6	–	–	–	–	3	10	–
Hydrogen chloride	7647-01-0	–	–	–	–	5	7	–
Hydrogen cyanide	74-90-8	–	–	4.7	5	–	–	x
Hydrogen fluoride (as F)	7664-39-3	3	–	6	–	–	–	–
Hydrogen peroxide	7722-84-1	1	1.4	–	–	–	–	–
Hydrogen selenide (as Se)	7783-07-5	0.05	0.2	–	–	–	–	–
Hydrogen sulfide	7783-06-4	10	14	15	21	–	–	–
Hydroquinone	123-31-9	–	2	–	–	–	–	–
2-Hydroxypropyl acrylate	999-61-1	0.5	3	–	–	–	–	x
Indene	95-13-6	10	45	–	–	–	–	–
Indium and compounds (as In)	7440-74-6	–	0.1	–	–	–	–	–
Iodine	7553-56-2	–	–	–	–	0.1	1	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Iodoform	75-47-8	0.6	10	–	–	–	–	–
Iron oxide fume	1309-37-1	–	10	–	–	–	–	–
Iron pentacarbonyl (as Fe)	13463-40-6	0.1	0.8	0.2	1.6	–	–	–
Iron salts (soluble) (as Fe)	Varies with compound	–	1	–	–	–	–	–
Isoamyl acetate	123-92-2	100	525	–	–	–	–	–
Isoamyl alcohol (primary and secondary)	123-51-3	100	360	125	450	–	–	–
Isobutyl acetate	110-19-0	150	700	–	–	–	–	–
Isobutyl alcohol	78-83-1	50	150	–	–	–	–	–
Isooctyl alcohol	26952-21-6	50	270	–	–	–	–	x
Isophorone	78-59-1	4	23	–	–	–	–	–
Isophorone diisocyanate	4098-71-9	0.005	–	0.02	–	–	–	x
2-Isopropoxyethanol	109-59-1	25	105	–	–	–	–	–
Isopropyl acetate	108-21-4	250	950	310	1185	–	–	–
Isopropyl alcohol	67-63-0	400	980	500	1225	–	–	–
Isopropylamine	75-31-0	5	12	10	24	–	–	–
N-Isopropylaniline	768-52-5	2	10	–	–	–	–	x
Isopropyl ether	108-20-3	500	2100	–	–	–	–	–
Isopropyl glycidyl ether (IGE)	4016-14-2	50	240	75	360	–	–	–
Kaolin, Respirable dust Total dust	–	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Ketene	463-51-4	0.5	0.9	1.5	3	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m[3C]	ppm[B]	mg/m[3C]	ppm[B]	mg/m[3C]	Skin Designation
Lead inorganic (as Pb); see R 325.51901 et seq.[F]	7439-92-1	–	0.05 (50 ug/m^3)	–	–	–	–	–
Limestone, (calcium carbonate) Respirable dust Total dust	1317-65-3	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Lindane	58-89-9	–	0.5	–	–	–	–	x
Lithium hydride	7580-67-8	–	0.025	–	–	–	–	–
L.P.G. (Liquified petroleum gas)	68476-85-7	1000	1800	–	–	–	–	–
Magnesite, Respirable dust Total dust	546-93-0	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Magnesium oxide fume, Total particulate	1309-48-4	 –	 10	 –	 –	 –	 –	 –
Malathion dust	121-75-5	–	10	–	–	–	–	x
Maleic anhydride	108-31-6	1	–	–	–	–	–	–
Manganese, Compounds (as Mn) Fume (as Mn)	7439-96-5	 – –	 – 1	 – –	 – 3	 – –	 5 –	 – –
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	–	0.1	–	–	–	–	x
Manganese tetroxide (as Mn)	1317-35-7	–	1	–	–	–	–	–
Marble (calcium carbonate), Respirable dust Total dust	1317-65-3	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Mercury Inorganic and aryl compounds (As Hg) Organic compounds (as Hg) Vapor (as Hg)	7439-97-6	 – – –	 – 0.01 0.05	 – – –	 – 0.03 –	 – – –	 0.1 – –	 x x x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Mesityl oxide	141-79-7	15	60	25	100	–	–	–
Methacrylic acid	79-41-4	20	70	–	–	–	–	x
Methanethiol; see Methyl mercaptan								
Methomyl (Lannate)	16752-77-5	–	2.5	–	–	–	–	–
Methoxychlor dust	72-43-5	–	10	–	–	–	–	–
2-Methoxyethanol; see Methyl cellosolve								
4-Methoxyphenol	150-76-5	–	5	–	–	–	–	–
Methyl acetate	79-20-9	200	610	250	760	–	–	–
Methyl acetylene (Propyne)	74-99-7	1000	1650	–	–	–	–	–
Methyl acetylene-propadiene mixture (MAPP)	–	1000	1800	1250	2250	–	–	–
Methyl acrylate	96-33-3	10	35	–	–	–	–	x
Methylacrylonitrile	126-98-7	1	3	–	–	–	–	x
Methylal (Dimethoxymethane)	109-87-5	1000	3100	–	–	–	–	–
Methyl alcohol	67-56-1	200	260	250	325	–	–	x
Methylamine	74-89-5	10	12	–	–	–	–	–
Methyl amyl alcohol; see Methyl isobutyl carbinol								
Methyl n-amyl ketone	110-43-0	100	465	–	–	–	–	–
Methyl bromide	74-83-9	5	20	–	–	–	–	x
Methyl n-butyl ketone; see 2-Hexanone								
Methyl cellosolve (2-Methoxyethanol)	109-86-4	25	80	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	25	120	–	–	–	–	x
Methyl chloride	74-87-3	50	105	100	210	–	–	–
Methyl chloroform (1,1,1-Trichloroethane)	71-55-6	350	1900	450	2450	–	–	–
Methyl 2-cyanoacrylate	137-05-3	2	8	4	16	–	–	–
Methylcyclohexane	108-87-2	400	1600	–	–	–	–	–
Methylcyclohexanol	25639-42-3	50	235	–	–	–	–	–
o-Methylcyclohexanone	583-60-8	50	230	75	345	–	–	x
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	–	0.2	–	–	–	–	x
Methyl demeton	8022-00-2	–	0.5	–	–	–	–	x
4,4'-Methylene bis(2-chloroaniline) (MBOCA)	101-14-4	0.02	0.22	–	–	–	–	x
Methylene bis(4-cyclohexylisocyanate)	5124-30-1	–	–	–	–	0.01	0.11	–
Methylene bisphenyl isocyanate (MDI)	101-68-8	–	–	–	–	0.02	0.2	–
Methylene chloride, see R 325.51651 et seq.[F]	75-09-2	25	87	125	434			
Methylenedianiline (MDA); see R 325.50051 et seq.[F]	101-77-9	10 ppb**	0.08 mg/m³	100 ppb**	0.8 mg/m³	–	–	–
Methyl ethyl ketone (MEK); see 2-Butanone								
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	–	–	–	–	0.7	5	–
Methyl formate	107-31-3	100	250	150	375	–	–	–
Methyl hydrazine	60-34-4	–	–	–	–	0.2	0.35	x
Methyl iodide	74-88-4	2	10	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Methyl isoamyl ketone	110-12-3	50	240	–	–	–	–	–
Methyl isobutyl carbinol	108-11-2	25	100	40	165	–	–	x
Methyl isobutyl ketone; see Hexone								
Methyl isocyanate (MIC)	624-83-9	0.02	0.05	–	–	–	–	x
Methyl isopropyl ketone	563-80-4	200	705	–	–	–	–	–
Methyl mercaptan	74-93-1	0.5	1	–	–	–	–	–
Methyl methacrylate	80-62-6	100	410	–	–	–	–	
Methyl parathion	298-00-0	–	0.2	–	–	–	–	x
Methyl propyl ketone; see 2-Pentanone								
Methyl silicate	681-84-5	1	6	–	–	5	30	–
alpha-Methyl styrene	98-83-9	50	240	100	485	–	–	–
Metribuzin	21087-64-9	–	5	–	–	–	–	–
Mica; see Silicates								
Molybdenum, (as Mo) Insoluble compounds Soluble compounds	7439-98-7	 – –	 10 5	 – –	 – –	 – –	 – –	 – –
Monocrotophos (Azodrin®)	6923-22-4	–	0.25	–	–	–	–	–
Monomethyl aniline	100-61-8	0.5	2	–	–	–	–	x
Morpholine	110-91-8	20	70	30	105	–	–	x
Naphtha (Coal tar)	8030-30-6	100	400	–	–	–	–	–
Naphthalene	91-20-3	10	50	15	75	–	–	–
alpha-Naphthylamine; see O.H. rule 2301(10)[F]	134-32-7							

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
beta-Naphthylamine; see O.H. rule 2301(11)[F]	91-59-8							
Nickel carbonyl (as Ni)	13463-39-3	0.001	0.007	–	–	–	–	–
Nickel, Metal and insoluble compounds (as Ni) Soluble compounds (as Ni)	7440-02-0	 – –	 1 0.1	 – –	 – –	 – –	 – –	 – –
Nicotine	54-11-5	–	0.5	–	–	–	–	x
Nitric acid	7697-37-2	2	5	4	10	–	–	–
Nitric oxide	10102-43-9	25	30	–	–	–	–	–
p-Nitroaniline	100-01-6	–	3	–	–	–	–	x
Nitrobenzene	98-95-3	1	5	–	–	–	–	x
p-Nitrochlorobenzene	100-00-5	–	1	–	–	–	–	x
4-Nitrodiphenyl; see O.H. rule 2301(12)[F]	92-93-3							
Nitroethane	79-24-3	100	310	–	–	–	–	–
Nitrogen dioxide	10102-44-0	–	–	1	1.8	–	–	–
Nitrogen trifluoride	7783-54-2	10	29	–	–	–	–	–
Nitroglycerin	55-63-0	–	–	–	0.1	–	–	x
Nitromethane	75-52-5	100	250	–	–	–	–	–
1-Nitropropane	108-03-2	25	90	–	–	–	–	–
2-Nitropropane	79-46-9	10	35	–	–	–	–	–
N-Nitrosodimethylamine; see O.H. rule 2301(13)[F]	62-75-9							

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Nitrotoluene o-isomer m-isomer p-isomer	88-72-2 99-08-1 99-99-0	2	11	–	–	–	–	x
Nitrotrichloromethane; see Chloropicrin								
Nonane	111-84-2	200	1050	–	–	–	–	–
Octachloronaphthalene	2234-13-1	–	0.1	–	0.3	–	–	x
Octane	111-65-9	300	1450	375	1800	–	–	–
Oil mist, mineral	8012-95-1	–	5	–	–	–	–	–
Osmium tetroxide (as Os)	20816-12-0	–	0.002	–	0.006	–	–	–
Oxalic acid	144-62-7	–	1	–	2	–	–	–
Oxygen difluoride	7783-41-7	–	–	–	–	0.05	0.1	–
Ozone	10028-15-6	0.1	0.2	0.3	0.6	–	–	–
Paraffin wax fume	8002-74-2	–	2	–	–	–	–	–
Paraquat, respirable dust	1910-42-5 2074-50-2 4685-14-7	–	0.1	–	–	–	–	x
Parathion	56-38-2	–	0.1	–	–	–	–	x
Particulates not otherwise regulated, Respirable dust Total dust	– – –	– –	5 15	– –	– –	– –	– –	– –
Pentaborane	19624-22-7	0.005	0.01	0.015	0.03	–	–	–
Pentachloronaphthalene	1321-64-8	–	0.5	–	–	–	–	x
Pentachlorophenol	87-86-5	–	0.5	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Pentaerythritol, Respirable dust Total dust	115-77-5	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Pentane	109-66-0	600	1800	750	2250	–	–	–
2-Pentanone (Methyl propyl ketone)	107-87-9	200	700	250	875	–	–	–
Perchloroethylene (Tetrachloroethylene)	127-18-4	25	170	–	–	–	–	–
Perchloromethyl mercaptan	594-42-3	0.1	0.8	–	–	–	–	–
Perchloryl fluoride	7616-94-6	3	14	6	28	–	–	–
Perlite Respirable dust Total dust	93763-70-3	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Petroleum distillates (Naphtha) (Rubber solvent)		400	1600	–	–	–	–	–
Phenol	108-95-2	5	19	–	–	–	–	x
Phenothiazine	92-84-2	–	5	–	–	–	–	x
p-Phenylenediamine	106-50-3	–	0.1	–	–	–	–	x
Phenyl ether, vapor	101-84-8	1	7	–	–	–	–	–
Phenyl ether-biphenyl mixture, vapor	–	1	7	–	–	–	–	–
Phenylethylene; see Styrene								
Phenyl glycidyl ether (PGE)	122-60-1	1	6	–	–	–	–	–
Phenylhydrazine	100-63-0	5	20	10	45	–	–	x
Phenyl mercaptan	108-98-5	0.5	2	–	–	–	–	–
Phenylphosphine	638-21-1	–	–	–	–	0.05	0.25	–
Phorate	298-02-2	–	0.05	–	0.2	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Phosdrin (Mevinphos[R])	7786-34-7	–	0.1	–	0.3	–	–	x
Phosgene (Carbonyl chloride)	75-44-5	0.1	0.4	–	–	–	–	–
Phosphine	7803-51-2	0.3	0.4	1	1	–	–	–
Phosphoric acid	7664-38-2	–	1	–	3	–	–	–
Phosphorus (yellow)	7723-14-0	–	0.1	–	–	–	–	–
Phosphorus oxychloride	10025-87-3	0.1	0.6	–	–	–	–	–
Phosphorus pentachloride	10026-13-8	–	1	–	–	–	–	–
Phosphorus pentasulfide	1314-80-3	–	1	–	3	–	–	–
Phosphorus trichloride	7719-12-2	0.2	1.5	0.5	3	–	–	–
Phthalic anhydride	85-44-9	1	6	–	–	–	–	–
m-Phthalodinitrile	626-17-5	–	5	–	–	–	–	–
Picloram, Respirable dust Total dust	1918-02-1	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Picric acid	88-89-1	–	0.1	–	–	–	–	x
Piperazine dihydrochloride	142-64-3	–	5	–	–	–	–	–
Pindone (2-Pivalyl-1,3-indandione)	83-26-1	–	0.1	–	–	–	–	–
Plaster of Paris (Calcium sulfate), Respirable dust Total dust	26499-65-0	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Platinum (as Pt) Metal Soluble salts	7440-06-4	 – –	 1 0.002	 – –	 – –	 – –	 – –	 – –

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Portland cement, Respirable dust Total dust	65997-15-1	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Potassium hydroxide	1310-58-3	–	–	–	–	–	2	–
Propane	74-98-6	1000	1800	–	–	–	–	–
Propargyl alcohol	107-19-7	1	2	–	–	–	–	x
beta-Propriolactone; see O.H. rule 2301(14)[F]	57-57-8							
Propionic acid	79-09-4	10	30	–	–	–	–	–
Propoxur (Baygon)	114-26-1	–	0.5	–	–	–	–	–
n-Propyl acetate	109-60-4	200	840	250	1050	–	–	–
n-Propyl alcohol	71-23-8	200	500	250	625	–	–	–
n-Propyl nitrate	627-13-4	25	105	40	170	–	–	–
Propylene dichloride	78-87-5	75	350	110	510	–	–	–
Propylene glycol dinitrate	6423-43-4	0.05	0.3	–	–	–	–	–
Propylene glycol monomethyl ether	107-98-2	100	360	150	540	–	–	–
Propylene imine	75-55-8	2	5	–	–	–	–	x
Propylene oxide	75-56-9	20	50	–	–	–	–	–
Propyne; see Methyl acetylene								
Pyrethrum	8003-34-7	–	5	–	–	–	–	–
Pyridine	110-86-1	5	15	–	–	–	–	–
Quinone	106-51-4	0.1	0.4	–	–	–	–	–
Resorcinol	108-46-3	10	45	20	90	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Rhodium, Insoluble compounds (as Rh) Metal fume (as Rh) Soluble compounds (as Rh)	7440-16-6	– – –	0.1 0.1 0.001	– – –	– – –	– – –	– – –	– – –
Ronnel	299-84-3	–	10	–	–	–	–	–
Rosin core solder pyrolysis products, as formaldehyde	–	–	0.1	–	–	–	–	–
Rotenone	83-79-4	–	5	–	–	–	–	–
Rouge, Respirable dust Total dust	–	– –	5 10	– –	– –	– –	– –	– –
Selenium compounds (as Se)	7782-49-2	–	0.2	–	–	–	–	–
Selenium hexafluoride (as Se)	7783-79-1	0.05	0.4	–	–	–	–	–
Silica, amorphous, precipitated and gel	112926-00-8	–	6	–	–	–	–	–
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	–	6	–	–	–	–	–
Silica, crystalline cristobalite, Respirable dust	14464-46-1	–	0.05	–	–	–	–	–
Silica, crystalline quartz, Respirable dust	14808-60-7	–	0.1	–	–	–	–	–
Silica, crystalline tridymite, Respirable dust	15468-32-3	–	0.05	–	–	–	–	–
Silica, crystalline tripoli, Respirable dust	1317-95-9	–	0.1	–	–	–	–	–
Silica, fused, Respirable dust	60676-86-0	–	0.1	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS									
			TWA		STEL[D]		Ceiling		
Substance		CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Silicates (less than 1% crystalline silica)									
	Mica, respirable dust	12001-26-2	–	3	–	–	–	–	–
	Soapstone, respirable dust	–	–	3	–	–	–	–	–
	Soapstone, total dust	–	–	6	–	–	–	–	–
	Talc (containing asbestos); use asbestos limit	–	R 325.51311 et seq., Asbestos for General Industry						
	Talc (containing no asbestos), respirable dust	14807-96-6	–	2	–	–	–	–	–
	Tremolite	R 325.51311 et seq., Asbestos for General Industry							
Silicon, Respirable dust Total dust		7440-21-3	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Silicon carbide, Respirable dust Total dust		409-21-2	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Silicon tetrahydride		7803-62-5	5	7	–	–	–	–	–
Silver, metal and soluble compounds (as Ag)		7440-22-4	–	0.01	–	–	–	–	–
Soapstone; see Silicates									
Sodium azide (as HN_3) (as NaN_3)		26628-22-8	 – –	 – –	 – –	 – –	 0.1 –	 – 0.3	 x x
Sodium bisulfite		7631-90-5	–	5	–	–	–	–	–
Sodium fluoroacetate		62-74-8	–	0.05	–	0.15	–	–	x
Sodium hydroxide		1310-73-2	–	–	–	–	–	2	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Sodium metabisulfite	7681-57-4	–	5	–	–	–	–	–
Starch, Respirable dust Total dust	9005-25-8	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Stibine	7803-52-3	0.1	0.5	–	–	–	–	–
Stoddard solvent	8052-41-3	100	525	–	–	–	–	–
Strychnine	57-24-9	–	0.15	–	–	–	–	–
Styrene	100-42-5	50	215	100	425	–	–	–
Subtilisins (Proteolytic enzymes)	9014-01-1	–	–	–	0.00006 (60 min.)	–	–	–
Sucrose, Respirable dust Total dust	57-50-1	 – –	 5 15	 – –	 – –	 – –	 – –	 – –
Sulfur dioxide	7446-09-5	2	5	5	10	–	–	–
Sulfur hexafluoride	2551-62-4	1000	6000	–	–	–	–	–
Sulfuric acid	7664-93-9	–	1	–	–	–	–	–
Sulfur monochloride	10025-67-9	–	–	–	–	1	6	–
Sulfur pentafluoride	5714-22-7	–	–	–	–	0.01	0.1	–
Sulfur tetrafluoride	7783-60-0	–	–	–	–	0.1	0.4	–
Sulfuryl fluoride	2699-79-8	5	20	10	40	–	–	–
Sulprofos	35400-43-2	–	1	–	–	–	–	–
Systox[R]; see Demeton								
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	93-76-5	–	10	–	–	–	–	–
Talc; see Silicates								

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Tantalum, metal and oxide dust	7440-25-7	–	5	–	–	–	–	–
TEDP (Sulfotep)	3689-24-5	–	0.2	–	–	–	–	x
Tellurium and compounds (as Te)	13494-80-9	–	0.1	–	–	–	–	–
Tellurium hexafluoride (as Te)	7783-80-4	0.02	0.2	–	–	–	–	–
Temephos, Respirable dust Total dust	3383-96-8	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
TEPP	107-49-3	–	0.05	–	–	–	–	x
Terphenyls	26140-60-3	–	–	–	–	0.5	5	–
1,1,1,2-Tetrachloro-2, 2-difluoroethane	76-11-9	500	4170	–	–	–	–	–
1,1,2,2-Tetrachloro-1, 2-difluoroethane	76-12-0	500	4170	–	–	–	–	–
1,1,2,2-Tetrachloroethane	79-34-5	1	7	–	–	–	–	x
Tetrachloroethylene; see Perchloroethylene								
Tetrachloromethane; see Carbon tetrachloride								
Tetrachloronaphthalene	1335-88-2	–	2	–	–	–	–	x
Tetraethyl lead (as Pb)	78-00-2	–	0.075	–	–	–	–	x
Tetrahydrofuran	109-99-9	200	590	250	735	–	–	–
Tetramethyl lead (as Pb)	75-74-1	–	0.075	–	–	–	–	x
Tetramethyl succinonitrile	3333-52-6	0.5	3	–	–	–	–	x
Tetranitromethane	509-14-8	1	8	–	–	–	–	–
Tetrasodium pyrophosphate	7722-88-5	–	5	–	–	–	–	–
Tetryl (2,4,6-Trinitrophenylmethylnitramine)	479-45-8	–	1.5	–	–	–	–	x

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Thallium, soluble compounds (as Tl)	7440-28-0	–	0.1	–	–	–	–	x
4,4'-Thiobis(6-tert-butyl-m-cresol) Respirable dust Total dust	96-69-5	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Thioglycolic acid	68-11-1	1	4	–	–	–	–	x
Thionyl chloride	7719-09-7	–	–	–	–	1	5	–
Thiram	137-26-8	–	5	–	–	–	–	–
Tin, Inorganic compounds (except oxides) (as Sn) Organic compounds (as Sn) Oxides (as Sn)	 7440-31-5 7440-31-5 21651-19-4	 – – –	 2 0.1 2	 – – –	 – – –	 – – –	 – – –	 – x –
Titanium dioxide Total dust	13463-67-7	 –	 10	 –	 –	 –	 –	 –
Toluene	108-88-3	100	375	150	560	–	–	–
Toluene-2,4-diisocyanate (TDI)	584-84-9	0.005	0.04	0.02	0.15	–	–	–
m-Toluidine	108-44-1	2	9	–	–	–	–	x
o-Toluidine	95-53-4	5	22	–	–	–	–	x
p-Toluidine	106-49-0	2	9	–	–	–	–	x
Toxaphene; see Chlorinated camphene								
Tremolite; see Silicates								
Tributyl phosphate	126-73-8	0.2	2.5	–	–	–	–	–
Trichloroacetic acid	76-03-9	1	7	–	–	–	–	–
1,2,4-Trichlorobenzene	120-82-1	–	–	–	–	5	40	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
1,1,1-Trichloroethane; see Methyl chloroform								
1,1,2-Trichloroethane	79-00-5	10	45	–	–	–	–	x
Trichloroethylene	79-01-6	50	270	200	1080	–	–	–
Trichloromethane; see Chloroform								
Trichloronaphthalene	1321-65-9	–	5	–	–	–	–	x
1,2,3-Trichloropropane	96-18-4	10	60	–	–	–	–	–
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1000	7600	1250	9500	–	–	–
Triethylamine	121-44-8	10	40	15	60	–	–	–
Trifluorobromomethane	75-63-8	1000	6100	–	–	–	–	–
Trimellitic anhydride	552-30-7	0.005	0.04	–	–	–	–	–
Trimethylamine	75-50-3	10	24	15	36	–	–	–
Trimethyl benzene	25551-13-7	25	125	–	–	–	–	–
Trimethyl phosphite	121-45-9	2	10	–	–	–	–	–
2,4,6-Trinitrophenol; see Picric acid								
2,4,6-Trinitrophenylmethylnitramine; see Tetryl								
2,4,6-Trinitrotoluene (TNT)	118-96-7	–	0.5	–	–	–	–	x
Triorthocresyl phosphate	78-30-8	–	0.1	–	–	–	–	x
Triphenyl amine	603-34-9	–	5	–	–	–	–	–
Triphenyl phosphate	115-86-6	–	3	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	ppm[B]	mg/m3[C]	Skin Designation
Tungsten	7440-33-7							
Insoluble compounds (as W)		–	5	–	10	–		–
Soluble compounds (as W)		–	1	–	3	–	–	
Turpentine	8006-64-2	100	560	–	–	–	–	–
Uranium (as U)	7440-61-1							
Insoluble compounds		–	0.2	–	0.6	–	–	–
Soluble compounds		–	0.05	–	-	–	–	–
n-Valeraldehyde	110-62-3	50	175	–	–	–	–	–
Vanadium pentoxide	1314-62-1							
Fume (as V_2O_5)		–	0.05	–	–	–	–	–
Respirable dust (as V_2O_5)		–	0.05	–	–	–	–	–
Vegetable oil mists	–							
Respirable mist		–	5	–	–	–	–	–
Total mist		–	15	–	–	–	–	–
Vinyl acetate	108-05-4	10	30	20	60	–	–	–
Vinyl benzene; see Styrene								
Vinyl bromide	593-60-2	5	20	–	–	–	–	–
Vinyl chloride; see 325.51401 et seq.[F]	75-01-4	1	2.5	5	12.8			
Vinyl cyanide; see Acrylonitrile								
Vinyl cyclohexene dioxide	106-87-6	10	60	–	–	–	–	x
Vinylidene chloride (1,1-Dichloroethylene)	75-35-4	1	4	–	–	–	–	–
Vinyl toluene	25013-15-4	100	480	–	–	–	–	–
VM & P Naphtha	8032-32-4	300	1350	400	1800	–	–	–
Warfarin	81-81-2	–	0.1	–	–	–	–	–
Welding fumes (Total particulate)*	–	–	5	–	–	–	–	–

TABLE G-1-A. EXPOSURE LIMITS FOR AIR CONTAMINANTS								
		TWA		STEL[D]		Ceiling		
Substance	CAS No.[A]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	ppm[B]	mg/m³[C]	Skin Designation
Wood dust, all soft and hard woods (except Western red cedar)	–	–	5	–	10	–	–	–
Wood dust, Western red cedar	–	–	2.5	–	–	–	–	–
Xylene (o-,m-,p-isomers) (Dimethyl benzene)	1330-20-7	100	435	150	655	–	–	–
m-Xylene-alpha, alpha'-diamine	1477-55-0	–	–	–	–	–	0.1	x
Xylidine	1300-73-8	2	10	–	–	–	–	x
Yttrium	7440-65-5	–	1	–	–	–	–	–
Zinc chloride fume	7646-85-7	–	1	–	2	–	–	–
Zinc chromate (as CrO_3)	Varies with compound	–	–	–	–	–	0.1	–
Zinc oxide fume	1314-13-2	–	5	–	10	–	–	–
Zinc oxide, Respirable dust Total dust	1314-13-2	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Zinc stearate Respirable dust Total dust	557-05-1	 – –	 5 10	 – –	 – –	 – –	 – –	 – –
Zirconium compounds (as Zr)	7440-67-7	–	5	–	10	–	–	–

*	As determined from breathing-zone air samples.
**	Parts per billion.
A	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.
B	Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 torr.
C	Approximate milligrams of substance per cubic meter of air.
D	Duration is for 15 minutes, unless otherwise noted.
E	The final benzene standard in R 325.77101 et seq. applies to all occupational exposures to benzene, except some subsegments of industry where exposures are consistently under the action level. These subsegments include the distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures. For the excepted subsegments, the benzene limits in table G-2 apply.
F	Caution--this rule contains extensive requirements for exposure to these substances.

TABLE G-2
EXPOSURE LIMITS FOR AIR CONTAMINATES

Substance	8-hour, time-weighted average	Acceptable ceiling concentration	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour workshift.	
			Concentration	Maximum duration
S Benzene[E,F]	10 ppm	25 ppm	50 ppm	10 minutes
Beryllium and beryllium compounds	2 $\mu g/m^3$	5 $\mu g/m^3$	25 $\mu g/m^3$	30 minutes
S Ethylene dibromide	20 ppm	30 ppm	50 ppm	5 minutes

Note: **S** above signifies that skin contact shall not be allowed.